An Energy Efficiency Workshop & Exposition

Kansas City, Missouri

Renewable Energy: A Growing Part of a Federal Agency's Portfolio of Energy Options

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Presentation outline

- What is the Federal renewable goal?
- How do we plan to meet it?
- What is FEMP's role?
- What is the market potential?

Federal Renewable Goal

- In June, 2000, the Secretary of Energy established a Federal renewable goal under E.O. 13123.
- The Secretary recommended “that Federal agencies strive to meet 2.5% of its facilities’ electricity consumption from new renewable energy sources by 2005”.
- New refers to RE acquired by the Federal government after 1990.

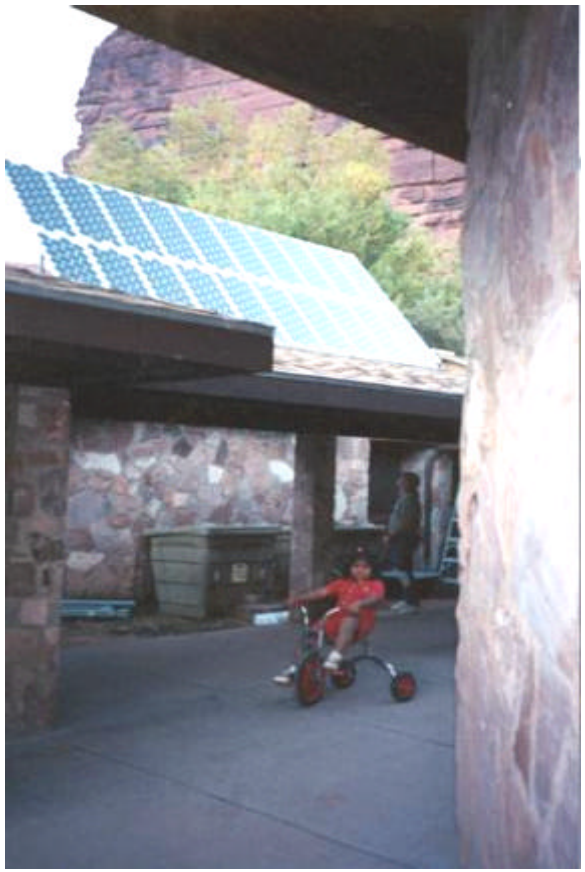
Federal Renewable Goal (cont.)

- E.O. 13123 Definitions;

  -- Sec 710. "***Renewable energy***" means energy produced by solar, wind, geothermal, and biomass power.

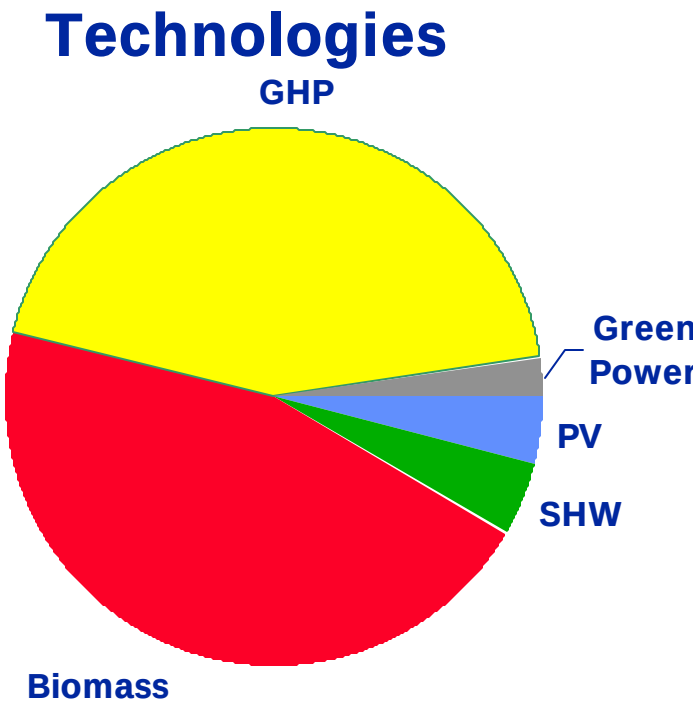
  -- Sec. 711. "***Renewable energy technology***" means technologies that use renewable energy to provide light, heat, cooling, or other activities. The term also means the use of integrated whole-building designs that rely upon renewable energy resources, including passive design.

What "counts" toward the goal



- On- and off-grid power technologies
- Thermal technologies
- Renewable transportation fuels
- Passive solar captured by equipment and building design
- Renewable energy from projects on Federal lands or facilities
- Renewable energy used by clients of Federal agencies (such as public housing).

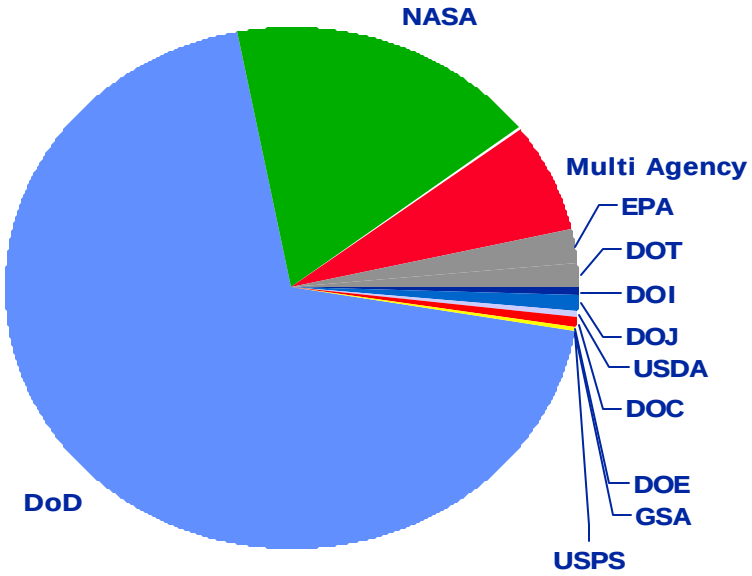
Progress Toward Federal Goal



Goal:	1335 GWh
Current:	213 GWh
To Go:	1122 GWh

Progress towards the goal

Agencies



Examples of new Federal Renewable Projects

Solarwall at Norfolk Navel Base

GSA's 100kW system at the Suitland Federal center

Low Energy Design at Zion National Park

Federal Strategy to Reach Goal

- Three basic approaches:

  -- Projects at Federal sites

  --Green power and green tags

  --Renewable energy projects facilitated by agencies or developed by agency clients

Renewable projects

Projects include renewable technologies that the agencies own:

- Wind
- Photovoltaics
- Solar water heating and air heating
- Geothermal heat pumps or geothermal heating and cooling
- On-site biomass electricity and thermal generation
- Passive solar design in buildings

Renewable Projects

Benefits of focusing on projects:

- Increasing track record and number of viable applications
- Ownership gives all the benefits to the Federal government (cost savings, reliability and security value)
- Electric reliability concerns make systems that reduce reliance on grid power or provide back-up power more attractive
- Educational value to Federal energy managers / end users

Areas of interest for Federal projects

- Replacing or providing back-up for remote diesel generators, where the costs and risks of fuel transportation make alternatives attractive
- Peak load reduction as per the California directives
- Building integrated products in new construction (passive solar, GHP, PV,SWH,Transpired collectors)
- Overseas installations where price is higher and reliability concerns may be larger
- Any system in sensitive environmental area
- Emergency response

Green Power and Green Tags

- Green power is purchased from a utility or power marketer. The power is typically fully or partially generated from a renewable energy source.
- Green tags is an indirect method to purchase green power where an agency purchases only the environmental attribute from the renewable generated electricity. The advantages of green tags are lower cost and that an agency can buy them anywhere—even if no direct green power products are available to them.

Green power and green tags

Benefits of focusing on green power and green tags:

- Avoids high capital costs of RE projects
- Potential for aggregated purchasing increases agency bargaining power and can simplify purchases for agencies with many sites.
- Federal managers take on no operating or maintenance risk for technologies
- Encourages a new important market sector for renewables

Facilitated projects

- Includes projects on Federal land where the agency assisted in some way (such as with the siting)
- Also R.E. used by clients of Federal agency (such as public housing)
- These projects offer great potential for large scale deployment

Projects Facilitated by Agencies or Developed by Agency Clients

- There are several large facilitated projects on the horizon

  -- 85 MW of wind at DOE's Nevada Test Site (NTS) by 2001, 260 MW total planned

  -- TBD amounts of wind at Ft. Bliss, White Sands Missle Range, Vandenberg AFB and Ft Huachuca

  -- Rural Utility Service low interest loan to Navajo Tribal Utility Authority at 350 kW of PV.

Projects Facilitated by Agencies or Developed for Agency Clients

Benefits of focusing on facilitated projects:

- Large projects are possible that are not limited by the level of demand the facility (such as NTS)
- Large projects could be a source of revenue for agencies if the siting involves leasing land
- There is a potential for strategically placing projects to enhance their distributed generation value
- Allows Federal agencies to tap a broader range of renewable resources that don't need to be near Federal loads

FEMP's Activities in Support of the Goal

Recently installed 4.5 kW PV at the USPS Sellers Mail Processing facility in San Diego, CA and now expanding to 12 kW

- FEMP is currently supporting over 30 RE projects. Requests for assistance outpaced supply 4:1
- In FY00, FEMP supported 34 RE projects with reported savings of 4,900 MWH / yr or $385,000.
- FEMP has assisted agencies with 10 renewable power purchase contracts
- Encouraged RE industry to get on GSA Supply schedule – currently 19 vendors doing $2 M / yr in sales.

RE Projects in support of the Bush's "California Directive"

- Federal agencies are to conserve energy and reduce peak demand in locations with price volatility and electricity supply shortages
- North American Electric Reliability Council areas of concern; CA, Northwest, New England, NYC
- Examples of FEMP projects supporting this:

-- 50 kW PV system at Edwards AFB (11 yr SPB)

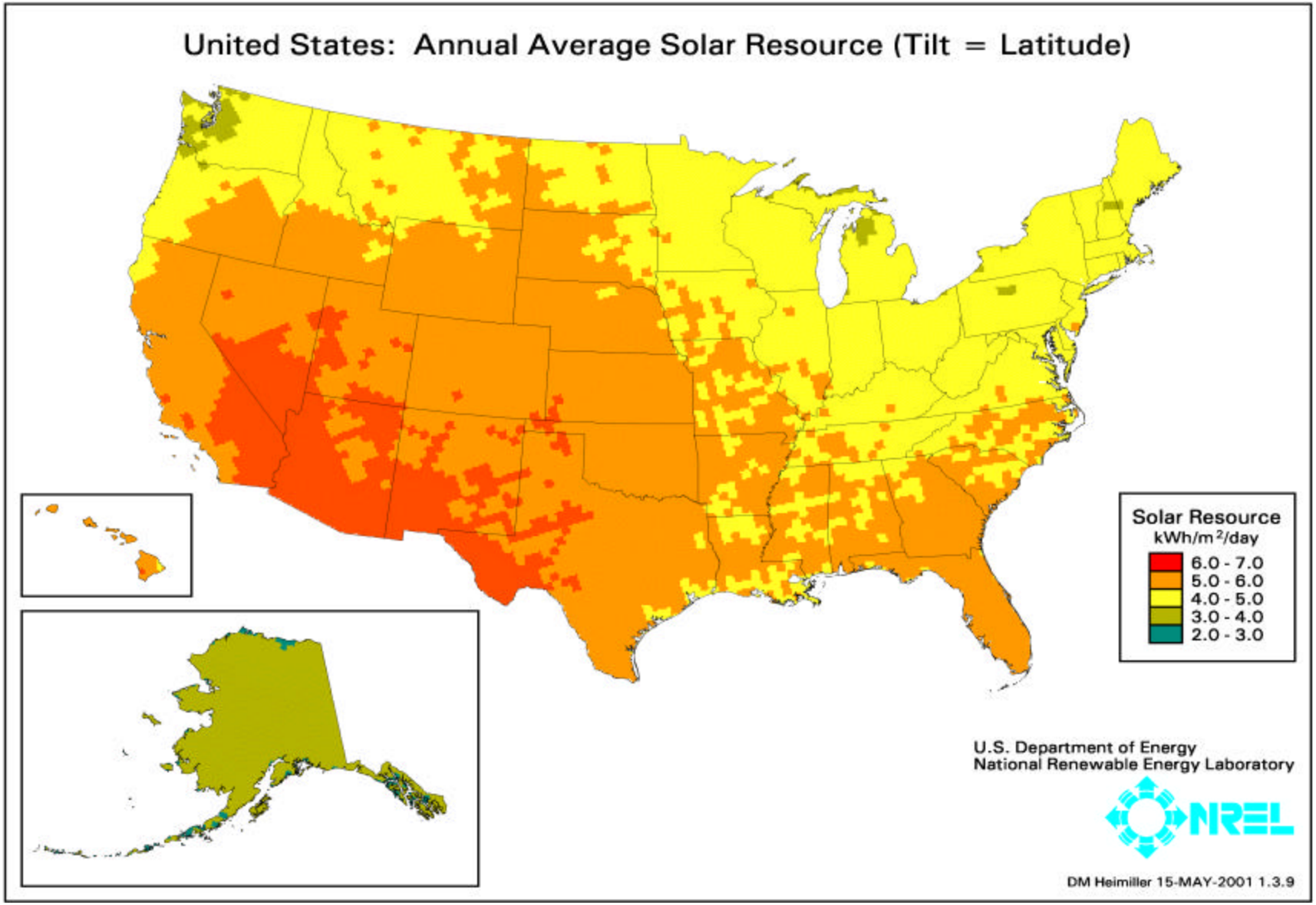
-- 3 MW wind farm at Edwards AFB (7 yr SPB)

-- 10 KW to power NWS radar at Miramar Naval Base (11 yr SPB)

-- 1 MW "Brightfield" at the City of San Diego Landfill site adjacent to the Marine Air Corps Air Station –Miramar (10-20 yr SPB)

-- 12 kW PV system for the USPS in San Diego (13 yr SPB)

Renewable Energy Federal Market Potential Maps



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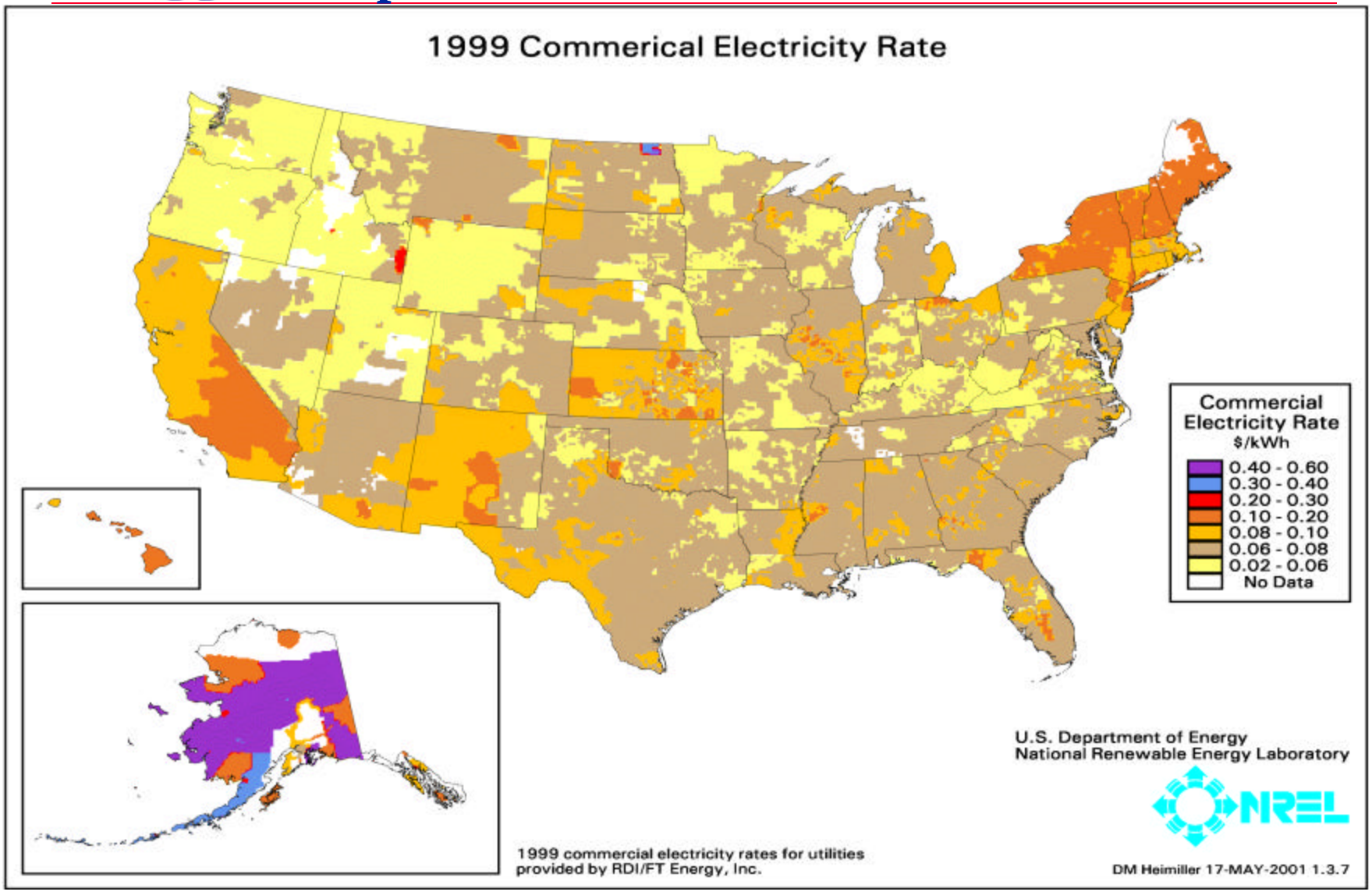

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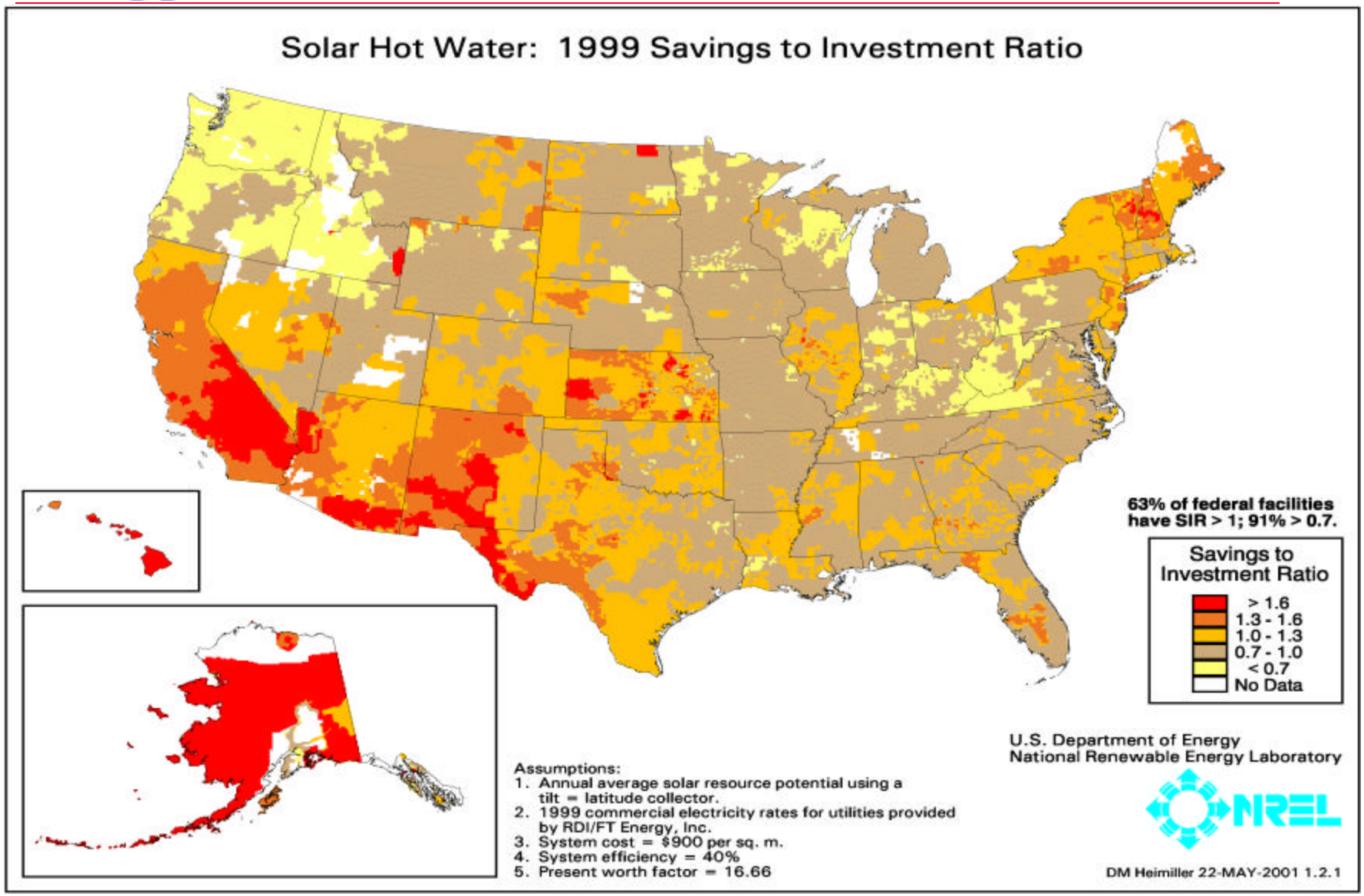

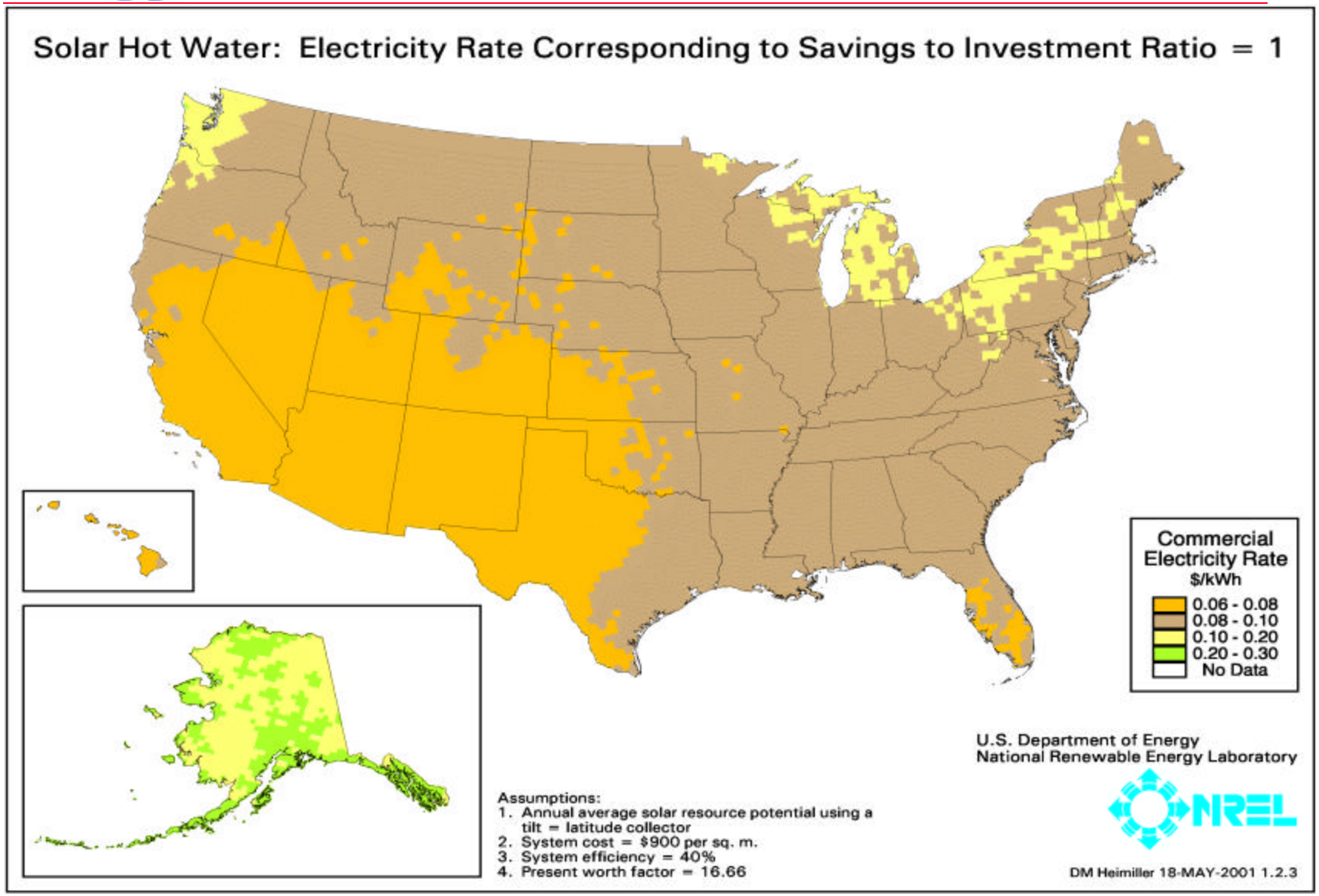
Solar Hot Water: Electricity Rate Corresponding to Savings to Investment Ratio = 1
Commercial Electricity Rate
$/kWh
0.06 - 0.08
0.08 - 0.10
0.10 - 0.20
0.20 - 0.30
No Data
U.S. Department of Energy
National Renewable Energy Laboratory
NREL
Assumptions:
1. Annual average solar resource potential using a tilt = latitude collector
2. System cost = $900 per sq. m.
3. System efficiency = 40%
4. Present worth factor = 16.66
DM Heimiller 18-MAY-2001 1.2.3

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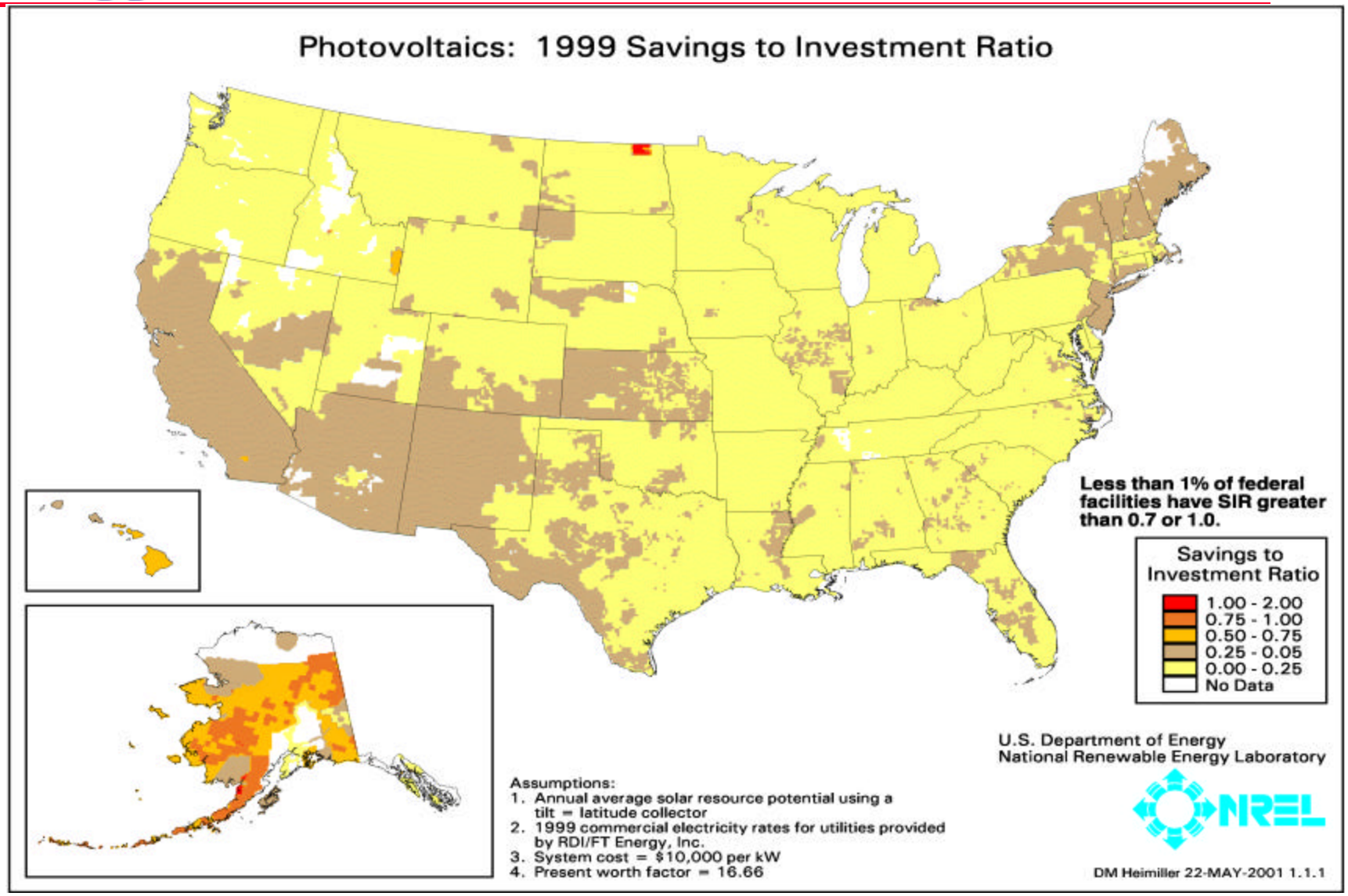

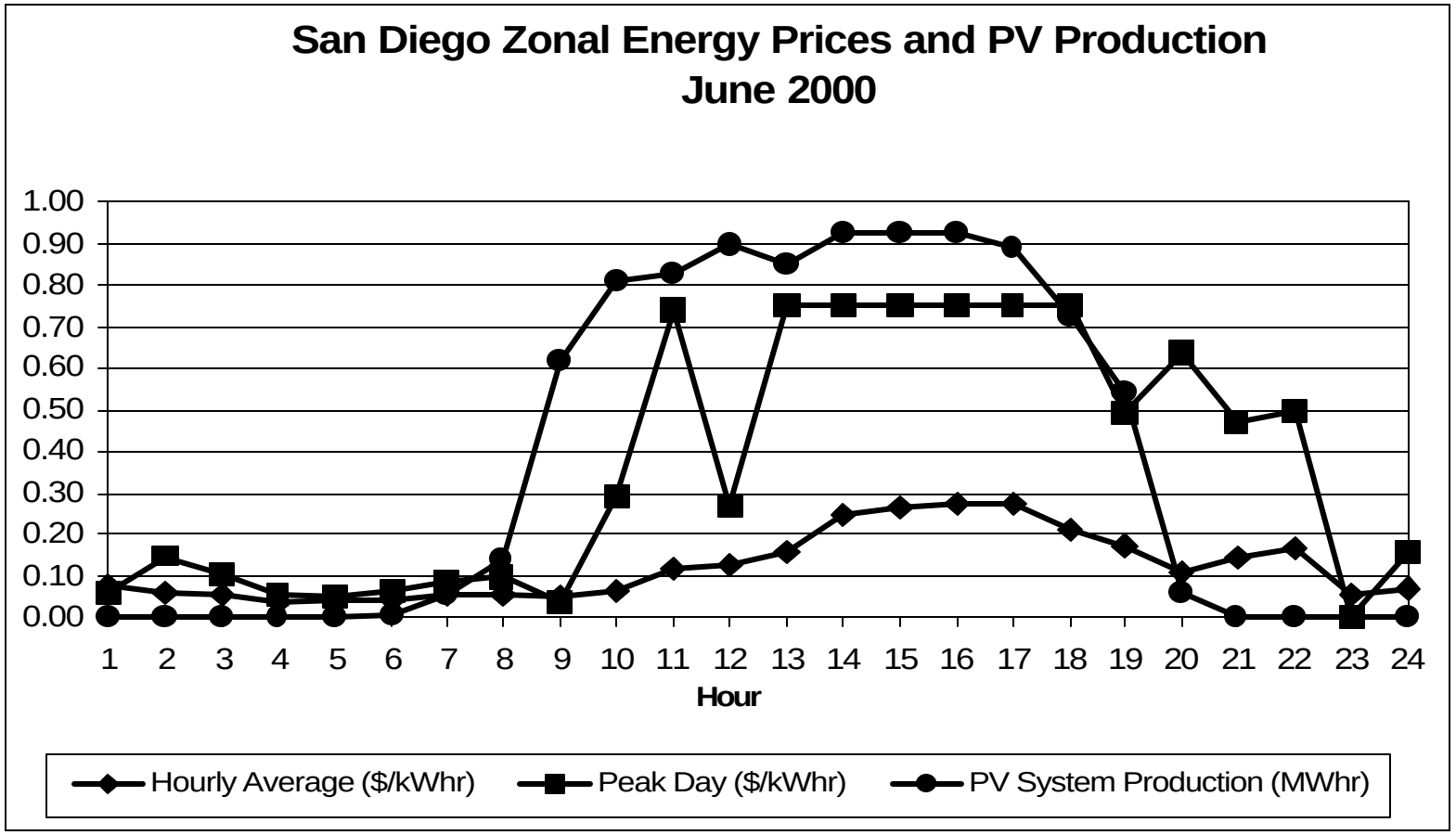

Source: Final Report: Technical and Economic Feasibility Assessment of a Brightfields PV Power plant at Miramar Landfill. Millenium Energy, Feb. 2001

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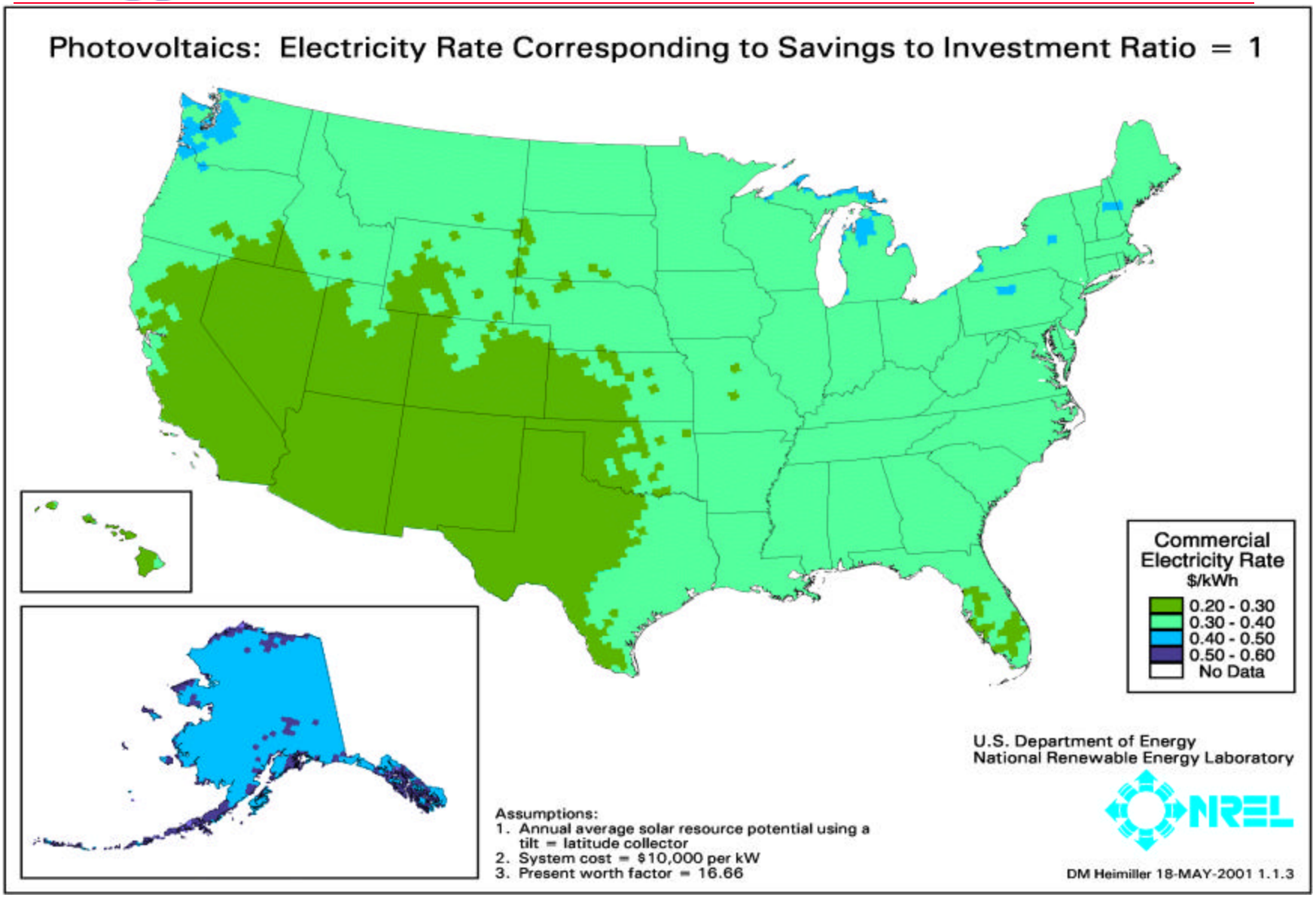

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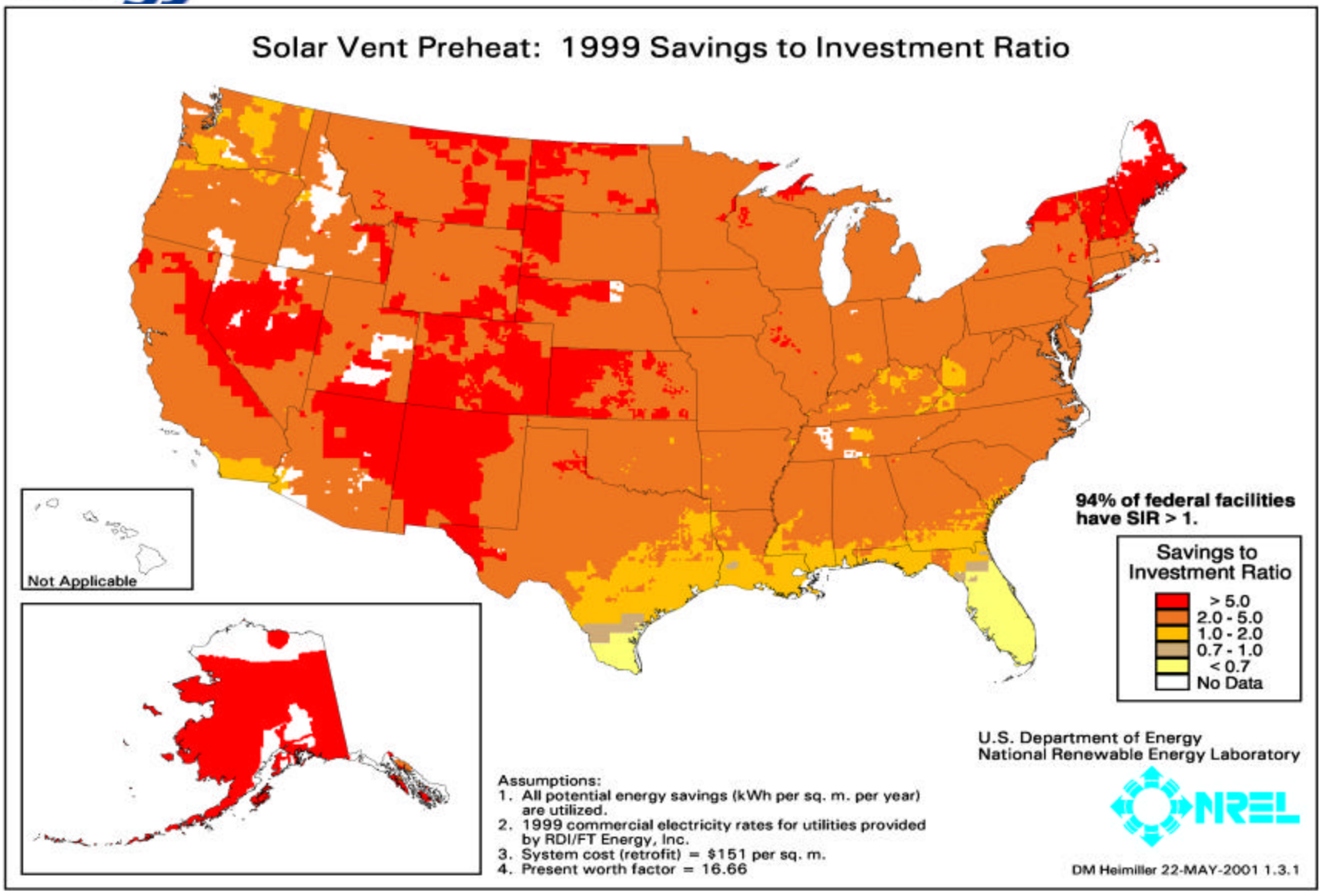

For more information:

- www.eren.doe.gov/femp/techassist/renewergy.html

- Join the Renewable Working Group – Jim Hoelscher – 301-731-1900
- The maps will be available at www.nrel.gov/gis. (If you need sooner call Donna Heimiller at 303-384-7098)
- Anne Sprunt Crawley, DOE 202-586-1505
- Nancy Carlisle, NREL 303-384-7509